

CLAIMS: *Please amend the claims according to the status designations in the following list, which contains all claims that were ever in the application, with the text of all active claims.*

1. – 5. (CANCELED)

6. (CURRENTLY AMENDED) A method for augmenting visual images of audio-visual entertainment systems, comprising the following steps of:

(a) enhancing facial images of a user or a plurality of users in a video input by superimposing virtual object images to said facial images,

(b) simulating a virtual stage environment image, further comprising steps of processing virtual object image selection, processing music selection, and composing virtual stage images,

(c) setting up masked regions on the simulated virtual stage environment image, and

(d) The method according to claim 4, wherein the method further comprises a step for positioning [a] the masked virtual stage environment image in front of [said user's body image] the body image of said user or said plurality of users,

whereby the step for enhancing facial images is processed at the level of local facial features on face images of said user or said plurality of users,

whereby examples of the facial features can be eye, nose, and mouth of said user or said plurality of users, and

whereby [said user's] the body image of said user or said plurality of users is shown through the transparency channel region of [said] the masked virtual stage environment image.

7. – 8. (CANCELED)

9. (CURRENTLY AMENDED) The method according to claim [-4] 6, wherein the method further comprises a step for using [~~said user's~~] movement of said user or said plurality of users to trigger [~~said~~] dynamically changing virtual background images, whereby without [~~said user's~~] the movement, [~~said user's image~~] said body image of said user or said plurality of users could disappear behind [~~said~~] the virtual background images, whereby this feature adds an interesting and amusing value to the system, in which said user or said plurality of users has to dance as long as said user or said plurality of users wants to see herself/himself on a means for displaying output, and whereby this feature can be utilized as a method for said user or said plurality of users to participate in a dance in front of [~~said~~] the audio-visual entertainment system.

10. (CURRENTLY AMENDED) The method according to claim [-4] 6, wherein the method further comprises a step for attaching musical instrument images, such as a guitar image or a violin image, to said [~~user's~~] body image of said user or said plurality of users, whereby [~~said~~] the attached musical instrument images dynamically move along with [~~said user's~~] arbitrary motion of said user or said plurality of users in real-time, and whereby said user or said plurality of users can also play the musical instrument by pretending as if he or she actually plays the musical instrument while looking at [~~said~~] the musical instrument image on [~~said~~] a means for displaying output.

11. – 15. (CANCELED)

16. (CURRENTLY AMENDED) An apparatus for augmenting visual images of an audio-visual entertainment system comprising:

(a) one or a plurality of means for capturing facial images from video input image sequences of a user or a plurality of users,

(b) means for displaying output,

~~The apparatus according to claim 11, wherein said means for processing and controlling further comprises means for performing the steps of:~~

~~[(a)]~~ (c) means for enhancing said facial images of said [one] user or [a] said plurality of users from said video input image sequences by superimposing virtual object images to said facial images,

~~[(b)]~~ (d) means for processing dynamically changing virtual background images according to [said user's] body movements of said user or said plurality of users,

~~[(c)]~~ (e) means for simulating [said] a virtual stage environment image by composing the enhanced facial and body image of said user or said plurality of users, virtual stage images, and virtual objects images, and

~~[(d)]~~ (f) means for handling interaction between said user or said plurality of users and said audio-visual entertainment system [.] ,

(g) a sound system, and

(h) a microphone,

whereby the means for enhancing facial images processes the facial image enhancement at the level of local facial features on said facial images of said user or said plurality of users, and whereby examples of the facial features can be eyes, nose, and mouth of said user or said plurality of users.

17. (CURRENTLY AMENDED) The apparatus according to claim 16, wherein ~~the apparatus for step (a) enhancing facial images of said one or a plurality of users from said video input image sequences~~ the (c) means for enhancing said facial images of said user or said plurality of users from said video input image sequences further comprises means for using a facial image enhancement process.

18. (CURRENTLY AMENDED) The apparatus according to claim 16, wherein ~~the apparatus for step (a) enhancing facial images of said one or a plurality of users from said video input image sequences~~ the (c) means for enhancing said facial images of said user or said plurality of users from said video input image sequences further comprises means for using the embedded FET system for [said] a facial image enhancement process.

19. (CURRENTLY AMENDED) The apparatus according to claim 16, wherein ~~the apparatus for step (c) simulating said virtual stage environment image~~ the (e) means for simulating a virtual stage environment image by composing the enhanced facial and body image of said user or said plurality of users, virtual stage images, and virtual objects images further comprises means for preparing said virtual object images, such as musical instrument images and stage images, off-line.

20. – 30. (CANCELED)

31. (NEW) The method according to claim 6, wherein the method further comprises a step for processing the facial image enhancement automatically, dynamically, and in real-time.

32. (NEW) The method according to claim 6, wherein the step (b) simulating a virtual stage environment image further comprises a touch free interface for processing virtual object image selection and processing music selection.

33. (NEW) The method according to claim 32, wherein the method further comprises a step for processing

(a) said virtual object image selection and said music selection by said touch free interface,

(b) the enhancement of said facial images at the local facial feature level, and

(c) the composition of the virtual stage images on any arbitrary background in the actual

environment rather than a controlled background, such as a blue-screen style background,

whereby the dynamic background construction can be processed by an adaptive background

subtraction algorithm.

34. (NEW) The method according to claim 6, wherein the method further comprises a step for combining the enhanced facial images of said user or said plurality of users and said body image of said user or said plurality of users with dynamically changing virtual background images, whereby the virtual background images dynamically change according to arbitrary movement of said user or said plurality of users in real-time.

35. (NEW) The apparatus according to claim 16, wherein the apparatus further comprises means for enhancing the facial images automatically, dynamically, and in real-time.

36. (NEW) The apparatus according to claim 16, wherein the means for simulating a virtual stage environment image further comprises means for:

(a) processing virtual object image selection,

(b) processing music selection, and

(c) composing virtual stage images,

wherein the selection is processed by a touch free interface.

37. (NEW) The apparatus according to claim 16, wherein the apparatus further comprises means for processing any arbitrary background in the actual environment rather than a controlled background, such as a blue-screen style background, for constructing said dynamically changing virtual background images, for processing of said facial images from said user or said plurality of users in order to obtain facial features and body movement information of said user or said plurality of users, and for processing user interaction by a touch-free interface, whereby said dynamically changing virtual background images are background images which change according to arbitrary movement of said user or said plurality of users in real-time.

38. (NEW) The apparatus according to claim 16, wherein the apparatus further comprises a means for combining the enhanced facial images of said user or said plurality of users and the body images of said user or said plurality of users with said dynamically changing virtual background images, whereby the virtual background images dynamically change according to arbitrary movement of said user or said plurality of users in real-time, and whereby the enhanced facial images are accomplished at the local facial feature level, such as eyes, nose, and mouth.

39. (NEW) A method for augmenting images on a means for displaying output of an audio-visual entertainment system, comprising the following steps of:

(a) capturing a plurality of images for a user or a plurality of users with a single or a plurality of means for capturing images,

(b) processing a single image or a plurality of images from the captured plurality of images in order to obtain facial features and body movement information of said user or said plurality of users,

(c) processing selection by said user or said plurality of users for virtual object images on a means for displaying output,

(d) augmenting facial feature images of said user or said plurality of users with the selected virtual object images,

(e) simulating a virtual stage environment image, and

(f) displaying the augmented facial images with said facial feature images of said user or said plurality of users and the simulated virtual stage environment image on said means for displaying output,

whereby the step for augmenting facial feature images is processed at the level of local facial features on face images of said user or said plurality of users,

whereby examples of the local facial features can be eyes, nose, and mouth of said user or said plurality of users, and

whereby the step for augmenting facial feature images of said user or said plurality of users with the selected virtual object images is processed automatically, dynamically, and in real-time.

40. (NEW) The method according to claim 39, wherein the method further comprises a step for processing touch-free interaction for the selection of said virtual object images.

41. (NEW) The method according to claim 39, wherein the method further comprises a step for processing music selection by a touch-free interface.

42. (NEW) The method according to claim 39, wherein the method further comprises a step for processing any arbitrary background in the actual environment rather than a controlled background, such as a blue-screen style background, for constructing dynamically changing virtual background images, for processing of said single image or said plurality of images from said captured plurality of images in order to obtain facial features and body movement information of said user or said plurality of users, and for processing of selection by said user or said plurality of users for said virtual object images on said means for displaying output, whereby said dynamically changing virtual background images are background images which change according to arbitrary movement of said user or said plurality of users in real-time, and whereby the system can reside in any arbitrary environment.

43. (NEW) The method according to claim 42, wherein the method further comprises a step for combining the augmented facial images of said user or said plurality of users and body images of said user or said plurality of users with said dynamically changing virtual background images, whereby the virtual background images dynamically change according to arbitrary movement of said user or said plurality of users in real-time, and whereby the augmented facial images are accomplished at the local facial feature level, such as eyes, nose, and mouth.

44. (NEW) The method according to claim 43, wherein the method further comprises a step for positioning a masked virtual stage image in front of said body images of said user or said plurality of users,

whereby said body images of said user or said plurality of users are shown through the transparency channel region of said masked virtual stage image.

45. (NEW) The method according to claim 43, wherein the method further comprises a step for using movement of said user or said plurality of users to trigger the dynamically changing background images,

whereby without said movement of said user or said plurality of users, said body images of said user or said plurality of users could disappear behind the background image,

whereby this feature adds an interesting and amusing value to the system, in which said user or said plurality of users have to dance as long as said user or said plurality of users want to see themselves on said means for displaying output, and

whereby this feature can be utilized as a method for said user or said plurality of users to participate in a dance in front of the audio-visual entertainment system.

46. (NEW) The method according to claim 39, wherein the method further comprises a step for attaching musical instrument images, such as a guitar image or a violin image, to body images of said user or said plurality of users,

whereby the attached musical instrument images dynamically move along with the arbitrary motion of said user or said plurality of users in real-time, and

whereby said user or said plurality of users can also play the musical instrument by pretending as if he or she actually plays the musical instrument while looking at the musical instrument image on said means for displaying output.